Selected Response Key

#	Question Type	Learning Target	Nevada Academic Content Standard(s)	DOK Level	Key
1	MC	2.1	SID.B.6a	2	A
2	MC	1.3	F.BF.A.1b-2	2	D
3	FR	2.2	S.ID.B.6a, A.CED.A.2-2	3	—
4	FR	2.3	S.ID.B.6b	1	—
5	MC	2.3	S.ID.B.6b	1	C
6	MC	2.3	S.ID.B.6b	1	C
7	FR	2.5	S.ID.B.6b	2	—
8	MC	2.7	S.ID.B.6b	2	A
9	MC	3.1	A.CED.A.1-2	2	A
10	FR	3.1	S.ID.B.6a, A.CED.A.2-2	3	—

Free Response

5.

a) What kind of regression was used? Use this regression curve to estimate the number of members needed to be certain that the hunting will be successful.

Linear regression was used as the graph indicates. To be certain that the hunting will be successful about 20 members are needed.

b) Looking at the data, you might think that a quadratic fit would be better than the one used. Explain why.

The data is increasing when $x = [0,14]$ then appears to be decreasing when $x = 14$.

c) What reason could you give to support a non-linear fit?

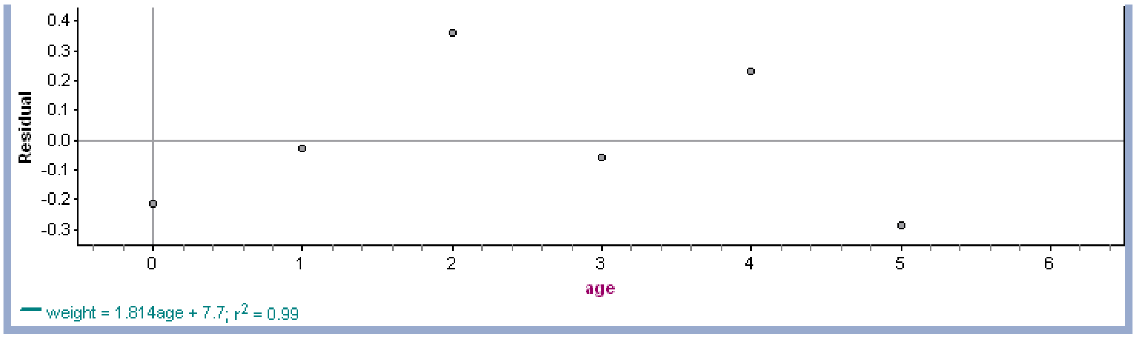
It's imaginable that there is an "optimal" number of members in the hunting party in order to get the highest percentage of successful hunts. I you have too few member, you won't get a high percentage, but if you have too many members, they will in in each other's way. The percentage goes down again. A linear fit would not model this situation.

6.

X(age in months)	Actual weight	Predicted weight	Residual
0	7.5	8	-0.5
1	9.5	9.8	-0.3
2	11.7	11.6	0.1
3	13.1	13.4	-0.3
4	15.2	15.2	0
5	16.5	17	-0.5

Free Response

The graph of the residuals follows:



9. A linear fit to the data may not be suitable because the distribution of residuals about the x-axis is not random and is not tight.

12.

a) Describe the graph.

The graph looks like the n-th root function, where n must be even. Some might confuse it with the logarithmic function, but there is no vertical asymptote and our function passes through origin.

(b) This graph was found in an old math book and next to it was written:

Rise of temperature = $t^{0.25}$
Show that this function does not describe the graph correctly.

Free Response

$t^{0.25} = t^{\frac{1}{4}} = \sqrt[4]{t}$

$\left(\sqrt[4]{1} = 1; \sqrt[4]{16} = 2; \sqrt[4]{27} = 3\right)$ $t^{0.25} = t^{\frac{1}{4}} = \sqrt[4]{t}$

$(1,1);(16,2);(81,3)$

As we know: $\sqrt[4]{1} = 1; \sqrt[4]{16} = 2; \sqrt[4]{81} = 3$ but there are no points of coordinates $(1,1);(16,2);(81,3)$ on the graph.

(c) Assume that the power function $r = At^{0.25}$ is a good description of the graph. Find a reasonable value for A. Graph the new function.

A reasonable value for A is 150. $r = 150t^{0.25}$ is a good approximation of the graph mentioned above.

d) Compare the graph in part (c) to the original one.
Do you think that a different power of t might result in a better model? Would a larger or smaller power produce a better fit? Explain.

Answers may vary: The graph of $r = 150t^{0.25}$ is too steep in the beginning and too flat for the bigger values of t. Therefore, a power that is a little bit bigger might produce a better fit.

e) Use the original graph to find data. Carry out a power regression on the data to find a function that would produce a better fit.

The regression model will depend on the data used. A sample function is $r = 137.5t^{0.3}$